



REPORT ON BIODIVERSITY -
MANGALAVANAM BIRD SANCTUARY

REPORT ON BIODIVERSITY OF MANGALAVANAM BIRD SANCTUARY

International Ship Repair Facility (ISRF) project site is located in the eastern side of Mattancherry channel at Wellington Island in Thoppumpady village, Kochi tehsil of Ernakulam District in the state of Kerala. The site is located between 9° 56' 55.61" N, 76° 16' 0.99" E and 9° 56' 21.62" N, 76° 16' 12.19" E. Wellington Island is an artificial island created before independence and Cochin Port occupies main portion of the land area. Entire coastal area of the island is designated as port area and the proposed ship repair facility is considered as a port activity. Mangalavanam Bird Sanctuary is located within 10 kilometres of the project site. Mangalavanam Bird sanctuary is at an aerial distance of approximately 4.3 kilometres towards the North- Northwest direction from the project site. **Figure 1** and **Figure 2** show the location of the sanctuary with respect to the project site. It was declared as protected area on 31st August 2004. The Mangalavanam Bird sanctuary is known as the "green lung of Kochi" which is otherwise polluted by its various industries and vehicles. It covers an area of about 0.0274 square kilometres.

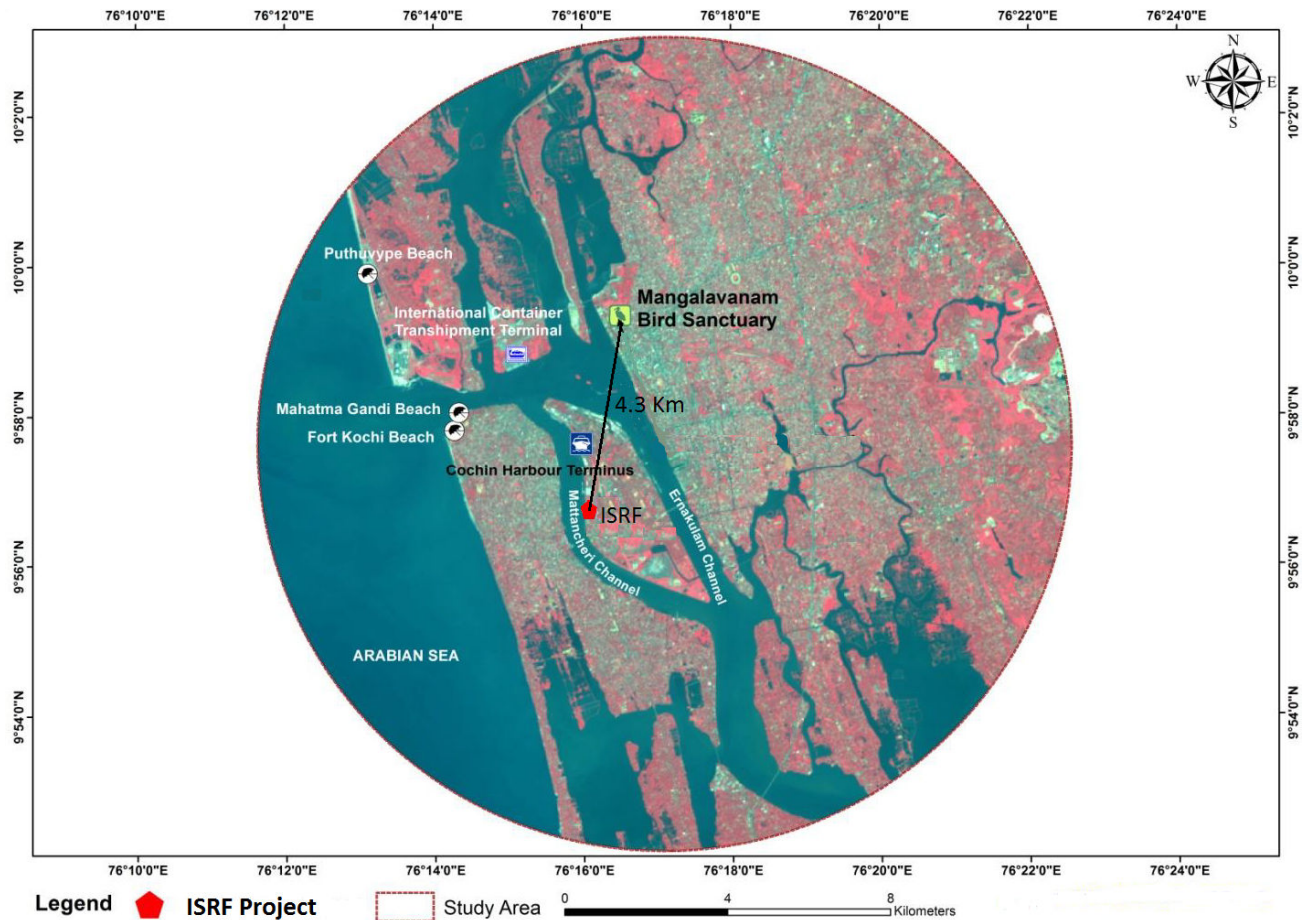


Figure 1: Location of Magalavanam Bird Sanctuary w.r.t ISRF Project site

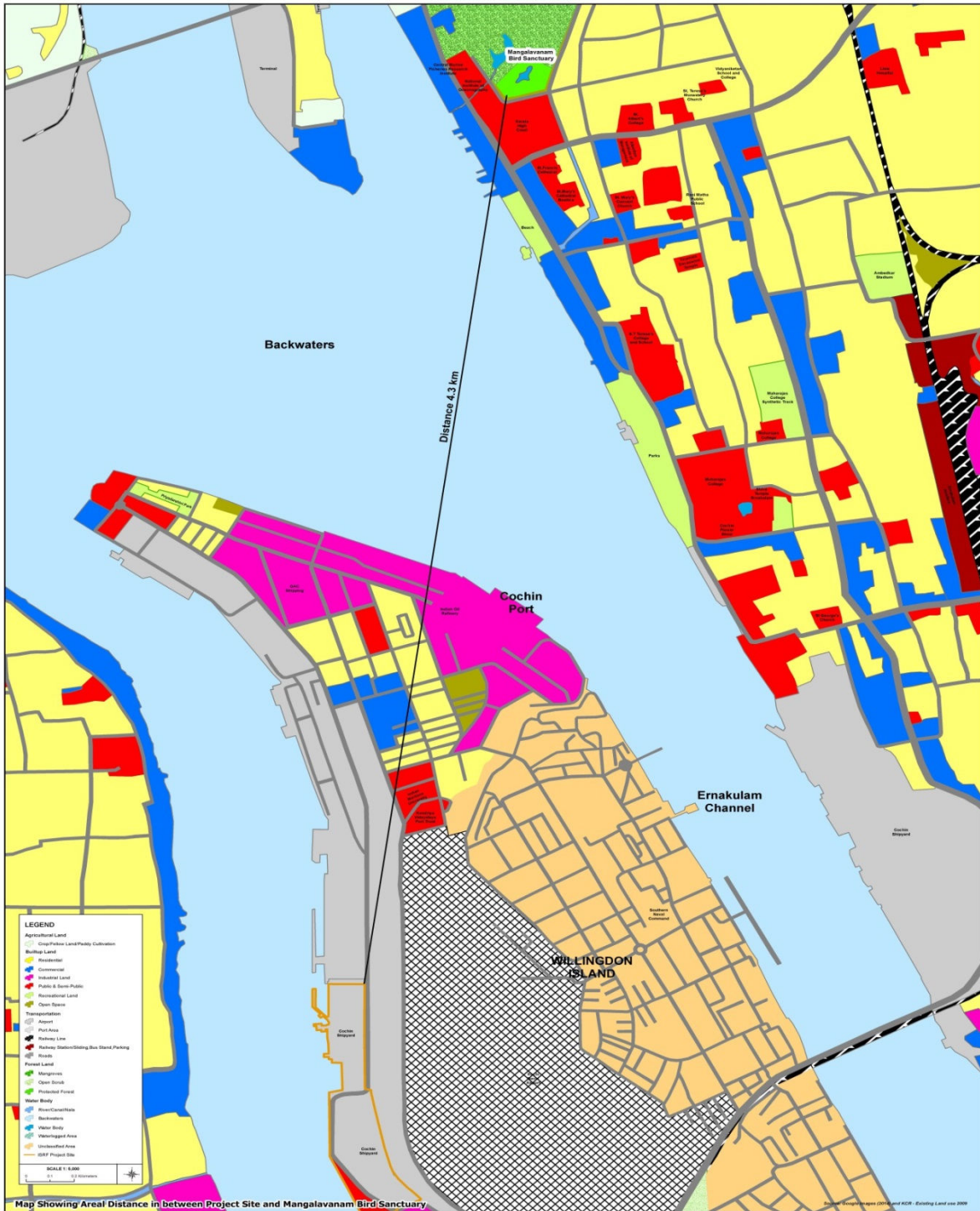


Figure 2: Project site and its surroundings

Mangalavanam Bird sanctuary is a tidal wetland area with shallow tidal lake in the middle, lined by thick mangrove vegetation. It is important because of large variety of resident and migratory birds and mangrove vegetation. About 2.74 ha area is occupied by mangrove flora with good height, but the patches are sparsely dense. The area happens to be a roosting place for exotic varieties of resident and migratory birds.

Mangalvanam Bird sanctuary is the only declared bird sanctuary in the Ernakulam district.

The biodiversity of the bird sanctuary is depicted below by describing the flora and fauna of the area.

FLORA

The species reported from the mangrove swamps of this area are *Avicennia officinalis*, *Rhizophora mucronata*, *Avicennia marina*, *Acrostichum aureum*, *Acanthus ilicifolius* and *Bruguiera parviflora*. Other than these mangrove species, dominated non-mangrove species like Eucalyptus and Teak are also present in this sanctuary area. **Photo Plate 1** shows few glimpses of commonly found flora in the bird sanctuary.



Avicennia officinalis



Rhizophora mucronata



Avicennia marina



Acanthus ilicifolius

Photo Plate 1: Common Flora of Mangalavanam Bird Sactuary**FAUNA**

Forty-two species of birds representing 12 Orders and 24 Families were recorded from Mangalavanam sanctuary which includes mostly resident birds. The most common bird species found are little cormorant (*Phalacrocorax niger*) and night heron (*Nycticorax nycticorax*) with the presence of 1500 little cormorant and more than 1000 night heron. **Table 1** enlists the species of birds reported from the Sanctuary.

Table 1 : Birds Found in Mangalavanam Bird sanctuary

ORDER	FAMILY	COMMON NAME	SCIENTIFIC NAME
Pelecaniformes	Phalacro coracidae	Large cormorant	<i>Phalacrocorax carbo</i>
		Little cormorant	<i>Phalacrocorax niger</i>
		Indian darter	<i>Anhinga melanogaster</i>
Ciconiiformes	Ardeidae	Purple heron	<i>Ardea purpurea</i>
		Pond heron	<i>Ardeola grayii</i>
		Cattle egret	<i>Bubulcus ibis</i>

ORDER	FAMILY	COMMON NAME	SCIENTIFIC NAME
		Large egret	<i>Ardea alba</i>
		Smaller egret	<i>Egretta intermedia</i>
		Little egret	<i>Egretta garzetta</i>
		Night heron	<i>Nycticorax nycticorax</i>
Falconiformes	Accipitridae	Pariah Kite	<i>Milvus migrans govinda</i>
Gruiformes	Rallidae	White breasted water hen	<i>Amauromis phoenicurus</i>
Charadriiformes	Charadriidae	Yellow-wattled lapwing	<i>Vanellus malabaricus</i>
Columbiformes	Columbidae	Blue rock pigeon	<i>Columba livia</i>
Psittaciformes	Psittacidae	Blossom headed parakeet	<i>Psittacula cyanocephala</i>
Galliformes	Phasianidae	Koel	<i>Eudynamys scolopacea</i>
		Crow pheasant	<i>Centropus sinensis</i>
Apodiformes	Apodidae	House swift	<i>Apus affinis</i>
Coraciiformes	Alcedinidae	Lesser pied Kingfisher	<i>Ceryle rudis</i>
Coraciiformes	Alcedinidae	Common Kingfisher	<i>Alcedo atthis</i>
		Storkbilled Kingfisher	<i>Pelargopsis capensis</i>
		Whitebreasted King fisher	<i>Halcyon smymensis</i>
		Whitecollard King fisher	<i>Halcyon chloris</i>
	Meropidae	Small green Bee-eater	<i>Merops orientalis</i>
Piciformes	Capitonidae	Small green barbet	<i>Megalaima viridis</i>

ORDER	FAMILY	COMMON NAME	SCIENTIFIC NAME
	Picidae	Lesser golden backed woodpecker	<i>Dinopiurn benghalense</i>
Passeriformes	Oriolidae	Golden oriole	<i>Oriolus oriolus</i>
	Dicruridae	Black drongo	<i>Dicrurus adsirnilis</i>
	Sturnidae	Common myna	<i>Acridotheres tristis</i>
		Jungle myna	<i>Acridotheres fuscus</i>
	Conidae	Tree pie	<i>Dentrocitta vagabunda</i>
		House crow	<i>Corvus splendens</i>
		Jungle crow	<i>Corvus rnacrorhynchos</i>
		Magpie robin	<i>Copsychus saularis</i>
	Irenidae	Gold mantled chloropsis	<i>Chloropsis cochinchinensis</i>
	Pycnonotidae	Redwhiskered bulbul	<i>Pycnonotus jocosus</i>
	Muscicapidae	Whiteheaded babbler	<i>Turdoides affinis</i>
		Tailor bird	<i>Orthotornus sutorias</i>
	Mottacillidae	Pied wagtail	<i>Motacilla alba</i>
		Large pied wagtail	<i>Motacila maderaspatensis</i>
Passeriformes	Nectarinidae	Crimson backed Sunbird	<i>Nectarinia minima</i>
	Ploceidae	House sparrow	<i>Passer dornesticus</i>

Source: Jayson, E.A. and Easa, P.S. (1999). Documentation of Vertebrate Fauna in Mangalavanam Mangrove Area: KFRI Research Report (183).

The mangrove swamps of the sanctuary are common roosting places for the birds. The lake is a rich feeding Zone (due to the presence of various fish and other aquatic organisms) for the birds, especially little egret, pond heron and cattle egret. The surrounding land use also supports the bird fauna for example blue rock pigeons feed on the grain left over in the adjoining railway goods yard. (Jayson, E.A. and Easa, P.S. (1999). *Documentation of Vertebrate Fauna in Mangalavanam Mangrove Area: KFRI Research Report (183)*).

Mangalavanam reportedly also supports 30 species of butterflies, four species of dragonflies, two species of damselflies, two species of amphibians, six species of mammals and four species of reptiles.

Mammals: Not many mammal species are reported from the sanctuary .The commonly found species are:

1. *Pteropus giganteus* (Indian flying fox),
2. *Kerivoula picta* (painted bat),
3. *Funnambulus pennant* (five-striped palm squirrel),
4. *Rattus rattus* (house rat),
5. *Bandicota indica* (bandicoot rat),
6. *Lutra sp.*(Otter) (not spotted in recent times).

Reptiles: the reptiles found in the sanctuary are:

1. *Ptyas mucosus* (Common rat snake),
2. *Naja naja* (Cobra)
3. *Vipera russelli* (Viper),
4. *Python molurus* (Python) (though it is in the past list of the year back in 1999 but no recent siting is recorded).

Fish: the fish fauna so far recorded from the swamp and lake area of the Sanctuary are listed below:

1. *Anabas testudines*
2. *Aplocheilus lineatus*
3. *Etroplus maculatus*
4. *Etroplus suratensis*
5. *Monopterus fossorius*
6. *Rasbora daniconius*
7. *Sarotherodon mossambica*.

(Source: Jayson, E.A. and Easa, P.S. (1999). *Documentation of Vertebrate Fauna in Mangalavanam Mangrove Area: KFRI Research Report (183)*).

Photo Plate 2 shows few commonly found fauna in bird sanctuary



Little cormorant (*Phalacrocorax niger*)



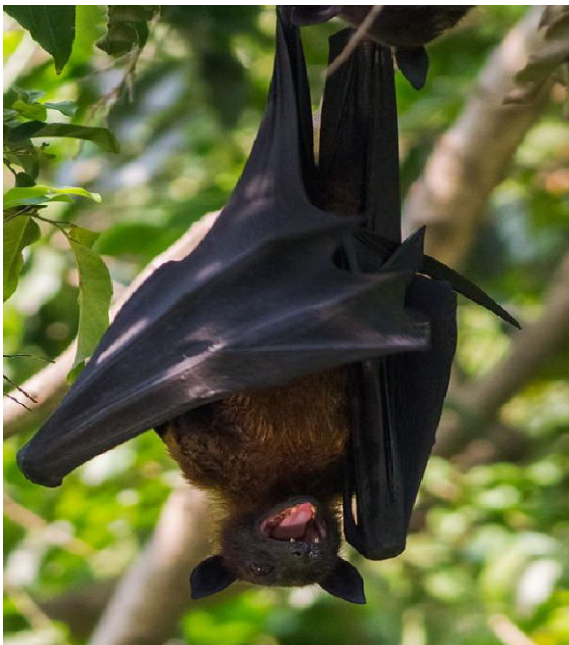
Night heron (*Nycticorax nycticorax*)



Otter (*Lutra lutra*)



Five-striped palm squirrel (*Funnambulus pennant*)



Indian flying fox (*Pteropus giganteus*)



Painted bat (*Kerivoula picta*)

Common rat snake (*Ptyas mucosus*)Cobra (*Naja naja*)**Photo Plate 2: Commonly found Fauna in Magalavanam Birds Sanctuary**

There are **no Rare or Endangered or Endemic or Threatened (REET) species in Mangalavanam Bird Sanctuary except *Lutra lutra* (otter), which is in Near Threatened category as per IUCN.** It is considered to be Near Threatened due to its earlier decline in population. But it is no longer declining at a rate of more than 30 % of its total (previously recorded) population since the past three generations. Moreover, in recent years, there is ample evidence of occurrence of its viable population in many parts of South and Southeast Asia.

The conservation status of the birds, mammals and reptiles reported to be found in the Mangalavanam Bird Sanctuary is presented as per the Wildlife Protection Act, 1972 and its amendments. Out of the total 52 recorded species of mammals, birds and reptiles, only one species is under Schedule-1 (Python under Schedule-I has not been reported to be sighted in the sanctuary since more than a decade now), four under Schedule-II and 29 are under Schedule –IV while the rest 18 species are not scheduled under the Wildlife Protection Act, 1972 and its amendments. The details are tabulated in **Table 2.**

Table 2: Conservation status of Fauna in Mangalavanam Bird Sanctuary

	Total Identified	Schedule – I	Schedule –II	Schedule-III	Schedule –IV	Not Mentioned
Birds	42	0	0	0	28	14
Mammals	6	0	1	0	1	4
Reptiles	4	1	3	0	0	0
Total	52	1	4	0	29	18

**All figures are in approximation*

Impacts and Mitigation Measures

Cochin Port Trust (CoPT) has a small dry dock and marine workshops at the western side of Wellington Island, facing the Mattancherry Channel for carrying out repairs and maintenance of small vessels. In order to stimulate the growth, facility has to be modernized and upgraded. CoPT therefore handed over this facility comprising of 17 ha land area to Cochin Shipyard Limited (CSL) for 30 years lease. Entire coastal area of the Wellington island is designated as port area and the proposed ship repair facility is considered as a port activity and therefore shall not involve any new land use changes in the region. The existing marine workshop facility is functional. The environmental impact of the proposed project activities on the sanctuary, which is about 4.30 Km, North- Northwest from the project site, is envisaged to be negligible.

The anticipated impacts from the probable sources of pollution will be localized, short lived and reversible both during construction and operational phases of the project.

During construction phase of the project, mitigation measures like regular water sprinkling, maintenance and good housekeeping of vehicles, periodical checking of pollution under control certificate for vehicles will keep the anticipated air pollution under control and localized. Moreover, already existing paved roads and green cover shall also limit the spread of dust and fugitives to the surrounding area. As such there will be no high frequency or loud noise from the construction as well as operational phases of the project. The mitigation measures like acoustic enclosures will also keep the noise under control. During operations of the proposed ISRF, no significant sources of air or noise pollution will be present. The waste generated from the site will be handled strictly in compliance with applicable Kerala Pollution Control Board's guidelines and best industry practices. Hence, there will be no significant impact on the sanctuary.

The anticipated impacts and proposed mitigation measures to be implemented during the construction and operational phases of the project are tabulated below in **Table 3**.

Table 3: Anticipated Impacts and Mitigation Measures of the Project site w.r.t. Mangalavanam Bird sanctuary

	SOURCE OF POLLUTION	PROPOSED MITIGATION MEASURE	ANY IMPACT ON SANCTUARY?
Construction phase	Air Environment: <ul style="list-style-type: none"> • Dust generation • Vehicular exhaust • Transportation of materials • DG set emissions 	<ul style="list-style-type: none"> • Regular water sprinkling at site. • Only vehicles carrying pollution under control certificate shall be allowed to operate. • All materials to be transported will be covered with tarpaulins • DG sets will be used only during power cut which is very unlikely to happen. 	There are no adverse impacts envisaged on the sanctuary life with strict implementation of the mitigation measures during the construction
	Noise Environment: <ul style="list-style-type: none"> • Use of equipment • Movement of vehicles • Operation of machineries • Piling activities. 	<ul style="list-style-type: none"> • State of the art technology with low noise construction equipment shall be used. • Equipment shall be provided with noise control measures to reduce noise at source itself. • Provision of earmuffs to the construction workers. • Regular maintenance of equipment and vehicles shall be ensured. 	
Operation phase	Marine Environment: <ul style="list-style-type: none"> • Disposal of wastewater from workshops, offices • Oil spill • Disposal of solid waste • Disposal of hazardous waste 	<ul style="list-style-type: none"> • No waste water will be discharged in to the water without standard treatment. • Treatment of hazardous waste will be dealt in compliance with Hazardous waste Management rules. At present CSL has engaged M/s Kerala Enviro Infrastructure Limited (KEIL), which is approved by Kerala State Pollution Control Board (KSPCB) for the safe disposal of hazardous wastes (copper slag / paint wastes). • All activities concerning oil or petrochemical products will be carried out only at demarcated locations in the 	The operational phase of the project is proposed to be very well equipped with strict mitigation and management measures ensuring compliance to all applicable guidelines of the KSPCB. No adverse impact is envisaged on the sanctuary or its flora and fauna.

		<p>site; spent oil will be stored separately and sold to authorized oil recyclers. An effective Contingency plan will be in place to address to any accidental oil spill emergency situation.</p> <ul style="list-style-type: none"> • Solid waste shall be segregated at source and collected at demarcated locations in the project site; thereafter it will be disposed off through agencies approved by the KSPCB. 	
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In view of the above, no significant project specific impacts are envisaged on the Mangalavanam Bird sanctuary. Moreover, the project’s green conservation measure in its surroundings is a noble approach in creating new nesting and breeding grounds and maintaining the existing ones for birds and other fauna.
